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(71) Applicant (for all designated States except US): **SOCI-
ETA' VETRARIA BIANCADESE SAS [IT/IT];** Via
Paris Bordone, 82, I-31030 Biancade (TV).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **LUCATELLO, Lu-
ciano [IT/IT];** Via D'Annunzio, 114, I-31040 Biancade
(TV).

(74) Agents: **AGOSTINI, Agostino et al.;** Dragotti & Associati
S.r.l., Via Paris Bordone, 9, I-31100 Treviso (IT).

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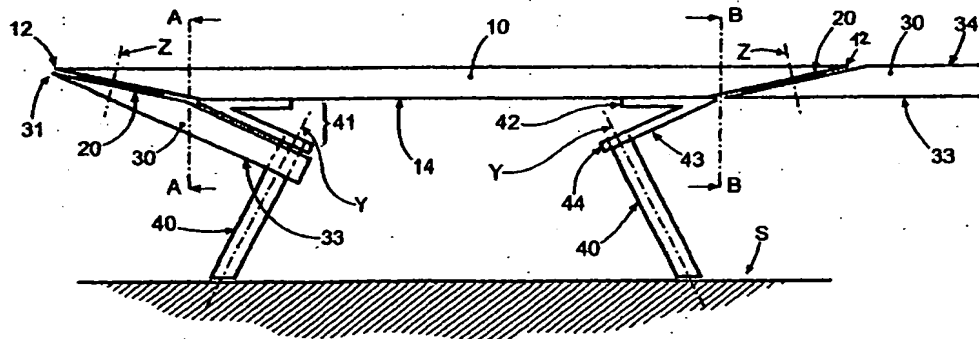
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(54) Title: **TABLE HAVING AT LEAST ONE EXTENSION CAPABLE OF BEING PULLED OUT THROUGH A MERE RO-
TATION**



(57) Abstract: Table comprising a fixed worktop (10) under which there are attached the legs for the support thereof, as well as a pull-out, i.e. extractable extension (30). The means (20) used to link the fixed worktop (10) with the extension (30) comprise members (21, 23) that are attached on respective section planes (13, 32) and are provided with interacting part (22, 24) extending along an axis (Z) that is orthogonal to said inclined section planes (13, 32). In this manner, the sole and only operation that has to be carried out in order to extract to retract the extension (30) is a rotation by 180° about said axis (Z). The fixed worktop is preferably either rectangular or square while the same worktop and the extensions can even be made with crystal panes.

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10 **TABLE HAVING AT LEAST ONE EXTENSION CAPABLE OF BEING
 PULLED OUT THROUGH A MERE ROTATION**

DESCRIPTION

- 15 The present invention refers to an extensible table, such as for instance a dining table having, further to a fixed worktop, at least one extension.

 Extensible tables generally arouse great interest on the part of consumers, since they take up just a reduced space, ie. just the one required by the fixed top surface thereof, for most
20 of the time. However, under practical use condition, they are quite frequently the object of criticism by the same consumers owing to the awkwardness of the operations that must be carried out in order to pull out, ie. extract the extensions thereof.

 An extensible table is known, for example from the disclosure in EP-A-0 857 483, which is
25 provided with a single arcuate guide, arranged according to the longitudinal centre-line plane thereof, acting as a structure supporting both the fixed central worktop of the table and the four legs thereof. Inside the axial cavity of such a guide there are associated telescopically a first and a second plate, to the end portions of which there are attached, on
30 the lower side thereof, the two extensions by means of controlled-motion hinge-like members.

 This kind of extensible table has a drawback in that, owing to the considerable length of the path of the plates onto the guide and the condition of sliding friction between contact surfaces, there may happen that the extensions get stuck during pulling out or retracting.

Furthermore, it should be duly considered that the extensions are only in contact with the borders of the fixed worktop, so that they have practically no possibility at all for them to be able to at least partly discharge on to said fixed worktop itself the stresses that are imparted to the same extensions during use.

5

It therefore would be desirable, and it is actually a main purpose of the present invention, to provide an extensible table that is free of such a kind of drawbacks, and is further capable of being easily manufactured at relatively low costs.

- 10 A further aim of the present invention is to improve the comfortableness of the people sitting around the table, regardless of the extensions being pulled out or retracted.

Another aim is to ensure that the extensions are prevented from being unintentionally moved with respect to the fixed worktop, in particular when the extensions and the
15 worktop are made with thick crystal panes and consequently particularly heavy as well as fragile.

A table having the features as recited in the appended claims enables these and further aims to be reached, as this shall be more readily understood from the description that is
20 given below of a couple of preferred, although not sole embodiment that are illustrated in the accompanying drawings, in which:

- Figure 1 is a side view of a rectangular extensible table according to the present invention, in which a first extension is shown when retracted state and a second extension
25 is shown when pulled out;

- Figure 2 is a top, partially see-through view of solely a half (for reasons of greater simplicity) of the same table in the extracted-extension configuration thereof;

30 - Figure 3 is a sectional view on an enlarged scale along the line A-A of Figure 1, showing the linking means between the fixed central worktop of the table and an extension thereof, when the latter is retracted;

- Figure 4 is a sectional view similar to the one appearing in Figure 3, however along the line B-B of Figure 1 and showing said linking means when the extension is when the extension is pulled out;
 - 5 - Figure 5 is an exploded view of alternative means for linking a fixed worktop made with a relatively thick crystal pane with an extension of the same type;
 - Figure 6 is a schematic top view of another embodiment of the invention.
- 10 A table according to the present invention comprises a fixed central worktop 10 (made preferably of wood) with a rectangular shape which, starting from the top surface 11 (ie. the surface that is exposed to view), is cut on the short sides 12 thereof according to the section planes 13 which, instead of being perpendicular to said surface 11, as this is the case in the great majority of prior-art tables, are inclined with respect thereto by an acute
- 15 angle α of indicatively 15 to 20 degrees, as this is best shown in Figure 3. As a result, the lower (ie. not exposed to view) surface 14 of the fixed worktop 10 of the table is shorter than the top surface 11 exposed to view.

In correspondence of each one of said short sides 12, to the fixed worktop 10 there is

20 associated an extension 30 which, when retracted, extends underneath the fixed worktop 10, as illustrated on the left side of Figure 1 as well as on Figure 3. The extension 30 is cut, starting from the side 31 thereof (which is parallel and adjacent to the short side 12 of the fixed worktop 10), according to a section plane 32 which is also inclined by the same afore

25 cited acute angle α with respect to the surface 33 that faces the floor S when the extension is retracted. The surface of the extension 30 lying on the opposite side of the above mentioned floor-facing surface 33, ie. the surface that remains exposed to view when the extension 30 is extracted as shown in Figure 4, is generally indicated at 34.

As it can be seen in the top view of Figure 2 the portion of the extension 30 has a

30 substantially rectangular shape in correspondence of the inclined section plane 32 while the portion 37, which is adapted to protrude from the short side 12 of the fixed worktop 10 is of a substantially semi-circular shape.

According to what has so been set forth above, when the extension 30 is in its retracted-state configuration, ie. in the configuration illustrated on the right side of Figure 1 and in Figure 3, the section planes 13 and 32 are adjacent and parallel to each other, whereas the surfaces 14 and 34, as well as the surfaces 11 and 33, form an acute angle $\beta = 2\alpha$.

5

The linking means provided between the fixed worktop 10 and the extension 30 to enable ~~the latter to be pulled out, and which are generally indicated at 20 in the Figures,~~ are arranged along the longitudinal centre-line plane P of the table and, as illustrated in Figures 2 and 4, consist of:

10

- 15 - a first rigid plate 21 attached to the worktop 10 (using traditional means that are not shown in the Figures, such as for example dowel-pins distributed along the perimeter thereof, or the like) in such a manner as to lie flush with, ie. on the same level as the inclined section plane 13, with the exception of a threaded stud 22 that is welded at the centre of the same plate in such a manner as to protrude downwards along an axis Z that is perpendicular to the plane 13. A recess 35, which is provided in the thickness of the extension 30 starting from the surface 33 thereof, accommodates the stud 22;
- 20 - a second rigid plate 23 that is similar to said first rigid plate 21 and is attached to the extension 30 in such a manner as to lie flush with, ie. on the same level as the inclined section plane 32, with the exception of a cylindrical bushing 24 that is welded at the centre of the same plate 23 so as to in turn protrude downwards into said recess 35, thereby being capable to accommodate in its interior said threaded stud 22, which it is coaxial with;
- 25 - a third plate 25, made of an antifriction material such as PTFE, or polytetrafluoroethylene, and featuring a minimum thickness, which is perforated centrally and is arranged between the adjacent surfaces of the rigid plates 21 and 23, where it is firmly retained by tightening a nut 26 on the protruding portion of the threaded stud 22 until it is brought into abutment against the end portion of the bushing 24 (which is
30 therefore provided with correspondingly appropriate inside diameter, outside diameter and length).

The common axis Z to both the threaded stud 22 and the bushing 24, perpendicular to the inclined section planes 13 and 32, is the axis about which - through a movement having an amplitude of 180 degrees - the extension 30 is caused to rotate with respect to the fixed worktop 10 in order to change from its retracted configuration to its extracted configuration, and vice-versa.

According to the main feature of the present invention, this rotation, which can be carried out most easily and conveniently by the user without any need arising for any considerable free space to be available around the table, is the sole and only handling required for switching from a configuration to the other one. The table may also be provided, in the proximity of the linking means 20, with a retaining device (not shown) adapted to ensure that a retraction of the table may only occur on purpose, and not accidentally.

A further feature of the present invention is given by the legs of the table, which are each of them consisting of a tubular body 40, for instance of a circular cross-section, that is attached to a rigid support 41 arranged. This rigid support 41 is in the shape of a "V" and comprises of an upper arm 42 extended along a plane X intercepting the mid plane P of the table at approximately the centre of the worktop 10 - see Figure 2 - and is attached to the lower surface 14 of the fixed worktop 10 through a plurality of screws 49, and also comprises a lower arm 43 that forms with the upper arm 42 an angle which preferably is exactly the afore mentioned angle $\beta = 2\alpha$, thereby conferring an appreciable aesthetical appearance to the table, as best illustrated in Figure 1. The arms 42 and 43 of the rigid support 41 are both substantially rectangular in their cross-section. The body 40 of the leg is attached to the free end 44 of the arm 43 along an axis Y perpendicular thereto, ie. inclined with respect to the floor S, for instance by means of a threaded stud 45 extending along the same axis Y - see Figure 1.

An alternative design of the linking means between a fixed worktop and an extension, particularly suitable when they are made with a fragile and heavy material like crystal, is illustrated in Figure 5. The said means, all preferably made with stainless steel, are :

- a cylindrical metal bushing 100 delimited between the ends 105, 107 which are perpendicular to its axis. A sloping wing 102, where three threaded holes 103, arranged in

a triangular layout, are provided, is attached to the bushing so as to protrude therefrom. A pair of axial grooves 104, 106 which have a semicircular cross-section and are spaced 180° from one another, are internally provided in the bushing 110. A round groove which also has a semicircular cross-section – such as the one shown in Figure 5 under reference numeral 108 – is provided at each of the said ends 105, 107. The purposes of the said grooves are clarified here below;

– a first round disc 110 consisting of a first flat portion 112 and a second portion 114 of a smaller diameter in which are provided four axial threaded holes 116 and a transversal groove 118 of a semicircular cross-section. An annular channel 119 of a semicircular cross-section is provided onto the face 113 of said first flat portion 112 looking at said second portion 114 of the disc 110;

– a second round disc 120 having a lower flat base 122 and an upper base which consists of a first flat portion 124 and a second sloping portion 126. Even if not shown in the enclosed drawing, on the flat base 122 there are : four axial threaded blind holes identical to the holes 116, a transversal groove of a semicircular cross-section identical to the transversal groove 118 and an annular channel of a semicircular cross-section identical to the channel 119 of the first disc 110;

– a third round and flat disc 130 having a smooth upper base 132 and a lower base provided with three threaded holes (not visible) matching with the holes 103 provided onto the wing 102 of the bushing 100;

– a spring 140 biasing a couple of pegs 142, 144 having round heads which match with the above mentioned axial grooves 104, 106 in the bushing 100 so as to be retained by the latter and partially retained in the groove 118 of the first disc 110.

Subsequent to assembling of the linking means the bushing 100 is sandwiched between the first disc 110 at the bottom and the second disc 120 at the top which are rigidly joined to one another through four bolts (not shown) screwed on the threaded holes 116 in the smaller portion 114 of the first disc 110 and the corresponding blind holes provided on the flat base 122 of the second disc 120. The legs of the bolts do obviously not interfere with the spring 140 subsequent to the insertion of the latter in the cavity formed by the matching transversal groove 118 of the bushing 110 and the matching groove of the second disc 120. A series of antifriction balls (not shown) are arranged in the round channel 108 at the base 107 of the bushing 100 and the corresponding channel on the flat base 122 of the the disc

120 while another series of balls are arranged in the round channel 119 of the disc 110 and the corresponding channel on the second base 105 of the bushing 100. As a consequence a frictionless relative rotational movement is allowed between the couple of discs 110, 120 on one side and the bushing 100 on the other side. The third disc 130 is in turn secured to
5 the wing 102 through three bolts (not shown) screwed on the threaded holes 103 and the corresponding holes provided on its lower base.

The linking means are connected as follows to the table. The first flat portion 124 of the upper base of the second disc 120 is firmly attached (preferably by means of a transparent
10 adhesive layer) to the lower surface – ie the surface that would not be exposed to view if it were made with a non transparent material – of the fixed worktop and the second sloping portion 126 to the adjacent inclined section plane of the same worktop through.

As in the preceding embodiment, when in the retracted configuration the extension lies
15 below the fixed worktop with the inclination of the sloped wing 102 so as to neither interfere with the fixed worktop nor with the legs of the table. Subsequent to a rotational movement of the bushing 100, having an amplitude of 180 degrees about its longitudinal axis, between the discs 110 and 120 the extension – integrally with the third disc 130 – can be brought into its extracted configuration. The extracted extension can obviously at ant
20 time be brought back to its retracted configuration by a rotational movement of the same amplitude in the opposite direction of the bushing 100. It will be appreciated that the spring 140 – which, as already mentioned, subsequent to assembly of the linking means is retained between the transversal groove 118 of the first disc 110 and the corresponding groove at the lower base 122 of the second disc – has the purpose of ensuring the due
25 stability of the extension in the retracted as well in the extracted configuration. In the example illustrated, when the extension is retracted, the peg 142 fits in the groove 104 and the peg 144 fits in the groove 102 while, when the extension 160 is extracted, the peg 142 fits in the groove 102 and the peg 144 fits in the groove 104.

30 While the preceding description is referred to a table where the fixed worktop is of a rectangular shape and the extensions are adapted to protrude from the short sides thereof, the table of the embodiment schematically shown in Figure 6 has a fixed worktop 150 with four identical sides 152 from which four identical extensions 154 are adapted to protrude thanks to associated linking means 158, which – although diagrammatically shown – are

are of any of the above described constructions. The protruding portions 155 of the extensions 154 are in the shape of a circular segment, in such a way that the table is adapted to be easily converted from a square shape when the extensions are in their retracted configuration (shown in dotted lines in Figure 6) to a round shape when all of the
5 four extensions are pulled out (shown in full lines).

From the preceding description, following practical advantages can be inferred to essentially derive from the present invention:

- 10 • the operations required to extract and retract the extensions can be carried out without difficulty whatsoever. Even when the extensions are relatively heavy, being made with glass panes, this result is achieved with a proper design of the said pegs and of their biasing spring and with the use of antifriction parts in the linking means;
- 15 • no need arises for a large free space to be available around the table during such extraction and retraction operations;
- the inclined section planes of the fixed worktop offer a good stability to the associated extension when the latter is extracted, so that the extension itself proves to be
20 adequately firm and rigid;
- the retracted extensions are of no practical nuisance or inconvenience to the people sitting around the table;
- 25 • even the legs of the table are arranged in such a manner as to be of as low an inconvenience as possible to the people sitting therearound, regardless of the extensions being retracted or extracted.

It will be appreciated that other embodiments of the present invention may be possible
30 without departing from the scope of the appended claims. In particular, this applies to the shape of the fixed worktop and/or the extensions, as well as the design (but not the geometrical characteristics) of the legs.

CLAIMS

1. Table comprising a fixed worktop (10; 150) under which there are attached the support legs, at least one extractable extension (30; 154) and means for linking said fixed worktop
5 with said extension, **characterized in that** the linking means (20) comprise mutually interacting parts (22, 24; 100, 110, 120, 130; 158) which are respectively attached to the lower surfaces (14) of the fixed worktop and to the lower surface (34) of the extension (30; 154) to allow for a 180° rotation of the extension (30; 160) with respect to the fixed worktop (10; 150) which is the sole and only operation required for bringing the extension
10 from its retracted configuration to its extracted configuration, and viceversa.
2. Table according to claim 1, **characterized in that** members (21, 23, 25) of the linking means (20) are mounted on section planes (13, 32) that are parallel to each other and inclined with respect to the surfaces (11, 33) of the fixed worktop (10) and the extension
15 (30), respectively, and are provided with interacting parts (22, 24) extending along an axis (Z) that is orthogonal to said inclined section planes (13, 32) so as to allow for a 180°-rotation of the extension (30) with respect to the fixed worktop (10), in which said rotation is the sole and only operation required for extracting the extension.
- 20 3. Table according to claim 2, **characterized in that** said members of the linking means (20) that are mounted on the inclined section planes (13, 32) consists of a first and a second rigid plate (21, 23) between which there is retained a further member (25) made of an antifriction material such as PTFE, or polytetrafluoroethylene.
- 25 4. Table according to claim 2 or 3, **characterized in that** the interacting parts of the linking means (20), which are accommodated in a recess provided in the extension (30) starting from the surface (33) thereof that is not exposed to view, consist of a threaded stud (22) and a bushing (24), respectively, and are adapted to be retained to each other by means of a nut (26).
30
5. Table according to claim 1, **characterized in that** the linking means comprise :
- a bushing (100) which is adapted to have a rotational movement about its longitudinal axis with respect to a pair of coaxial discs (110, 120) which are secured to one another and slidably mounted at the ends (105, 107) of the bushing, one of the said discs (120) having

its outer surface firmly attached to the bottom surface and to the adjacent inclined section plane of the fixed worktop, and

- a third disc (130) which is secured to a rigid sloping wing (102) which protrudes from the said bushing (100) as well as to the bottom surface of the corresponding extension.

5

6. Table according to claim 5, **characterized in that** elastic means (140) are supported in the said bushing (100) and so as to be selectively retained also by a transversal groove provided on the opposite flat face of the disc (120) which is attached to the bottom surface and to the inclined section plane of the fixed worktop to provide the stability of the extension with respect to the fixed worktop in the extracted as well as in the retracted configuration .

7. Table according to any of the preceding claims, **characterized in that** the body (40) of each leg is attached - in such a manner as to extend along an axis (Y) that is inclined with respect to the floor (S) - to a rigid support (41) in the shape of substantially a "V", more precisely to the free end (44) of the lower arm (43) of the said rigid support (41) that forms with the upper arm thereof (42) an angle (β) which is substantially twice the angle (α) of inclination of said axis of rotation (Z).

8. Table according to claim 7, **characterized in that** the upper arm (42) of the said rigid support (41) is arranged along a plane (X) intercepting the longitudinal mid plane (P) of the table and is attached to the lower surface (14) of the fixed worktop (10).

9. Table according to any of the preceding claims, **characterized in that** the fixed worktop (10; 150) is of a four-sides shape and the portion (37; 155) of the at least one extension (30; 130) which is adapted to protrude from a side thereof (12; 112) has a curved shape.

10. Table according to claim 9, **characterized in that** the fixed worktop (10) is of a rectangular shape and the the portion (37) of the at least one extension (30) which is adapted to protrude from a short side thereof (12) has the shape of a semicircle.

11. Table according to claim 11, characterized in that the fixed worktop (110) is of a square shape and the the portion (155) of the four extensions (154) which are adapted to protrude from the four sides thereof (152) have the shape of a circular segment in such a way that the table is adapted to be converted from a square shape when the extension (154) is in the retracted configuration to a round shape when the extension is in the extracted configuration.



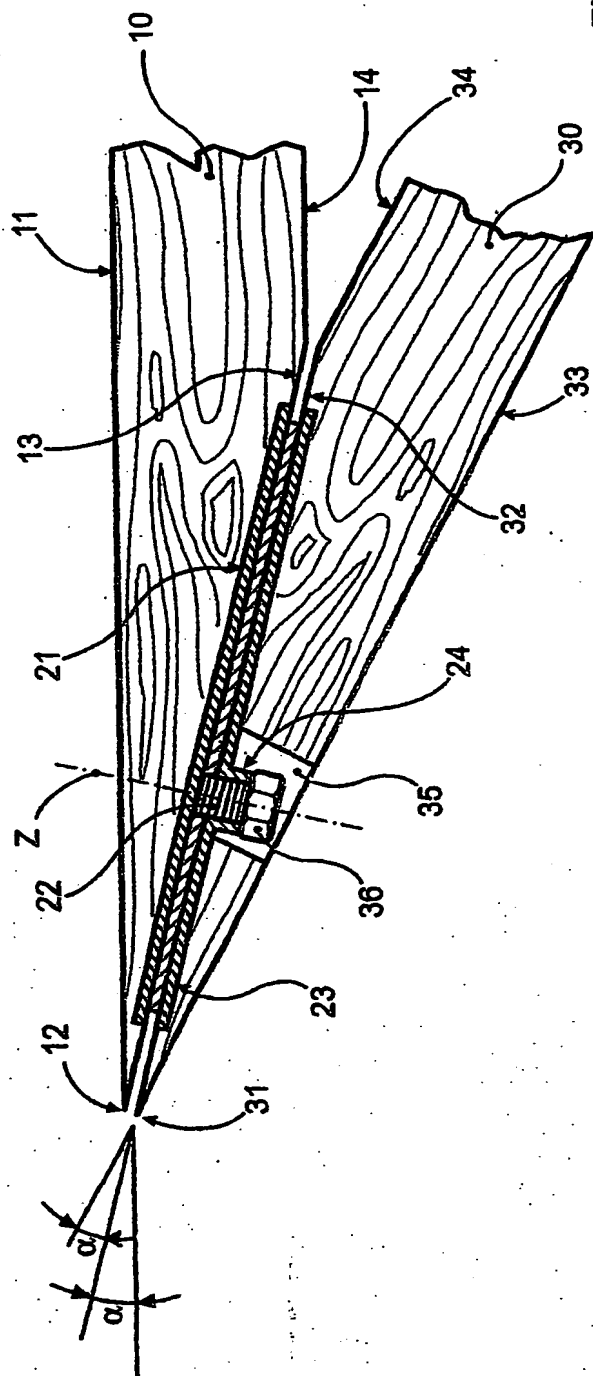


Fig. 3

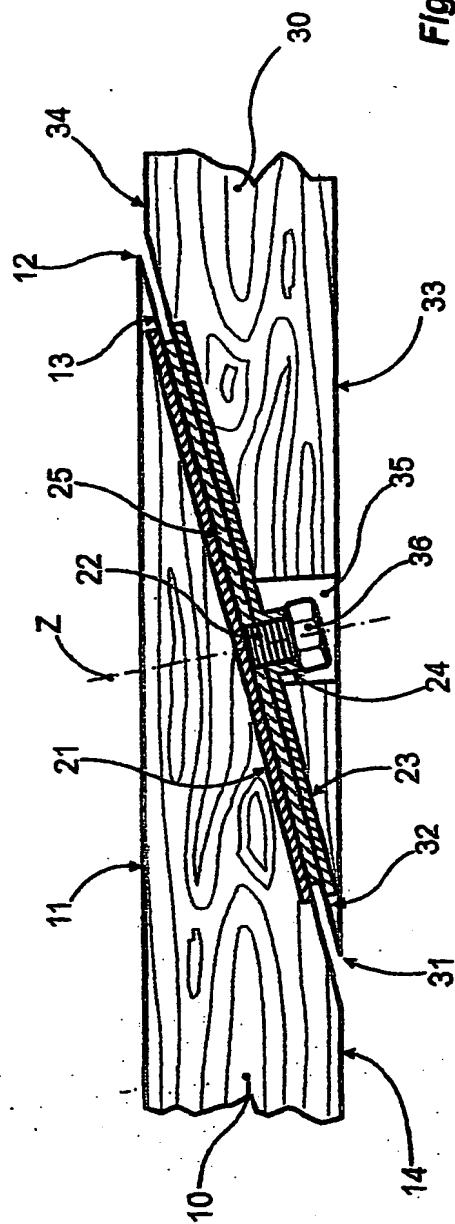


Fig. 4

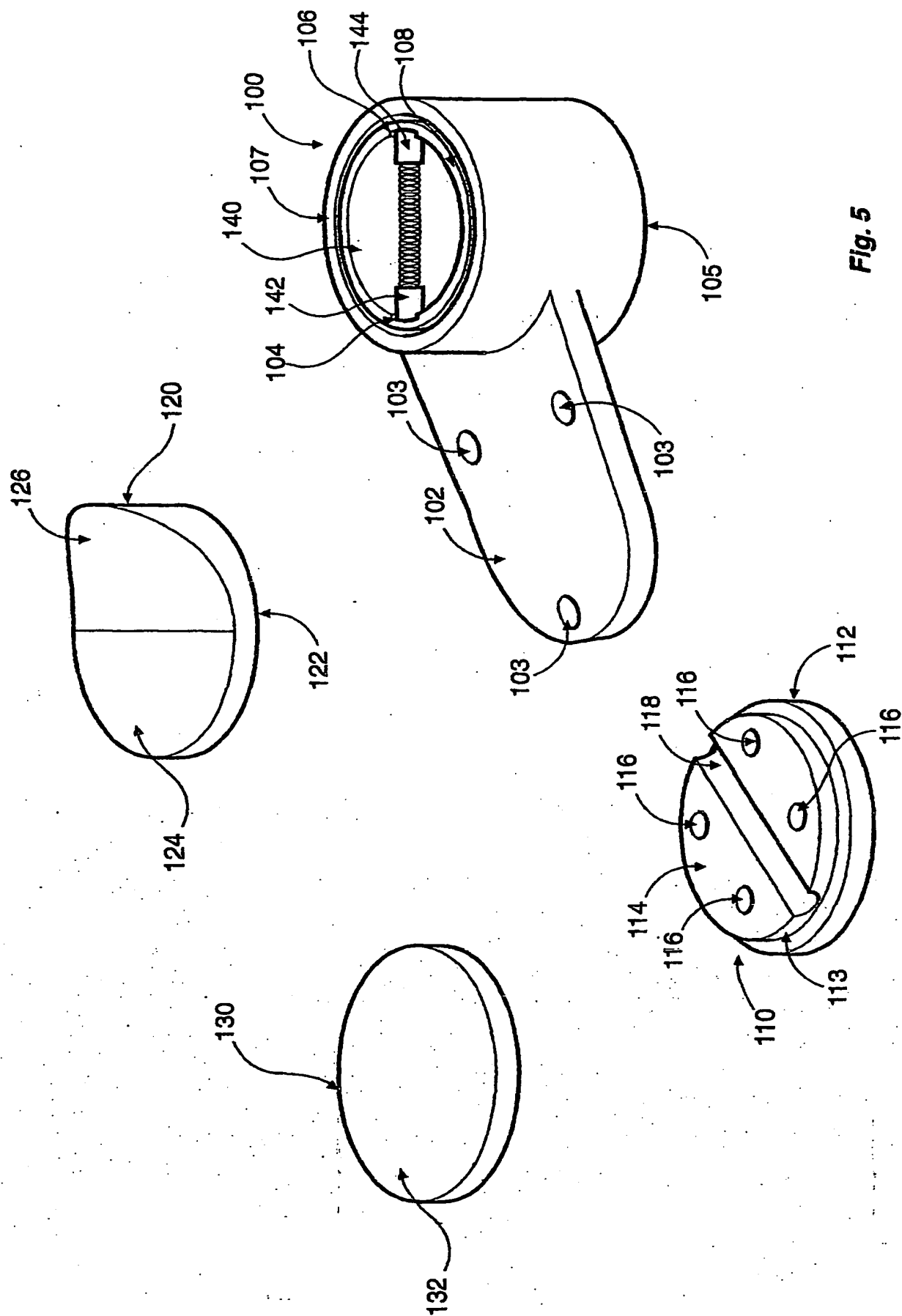
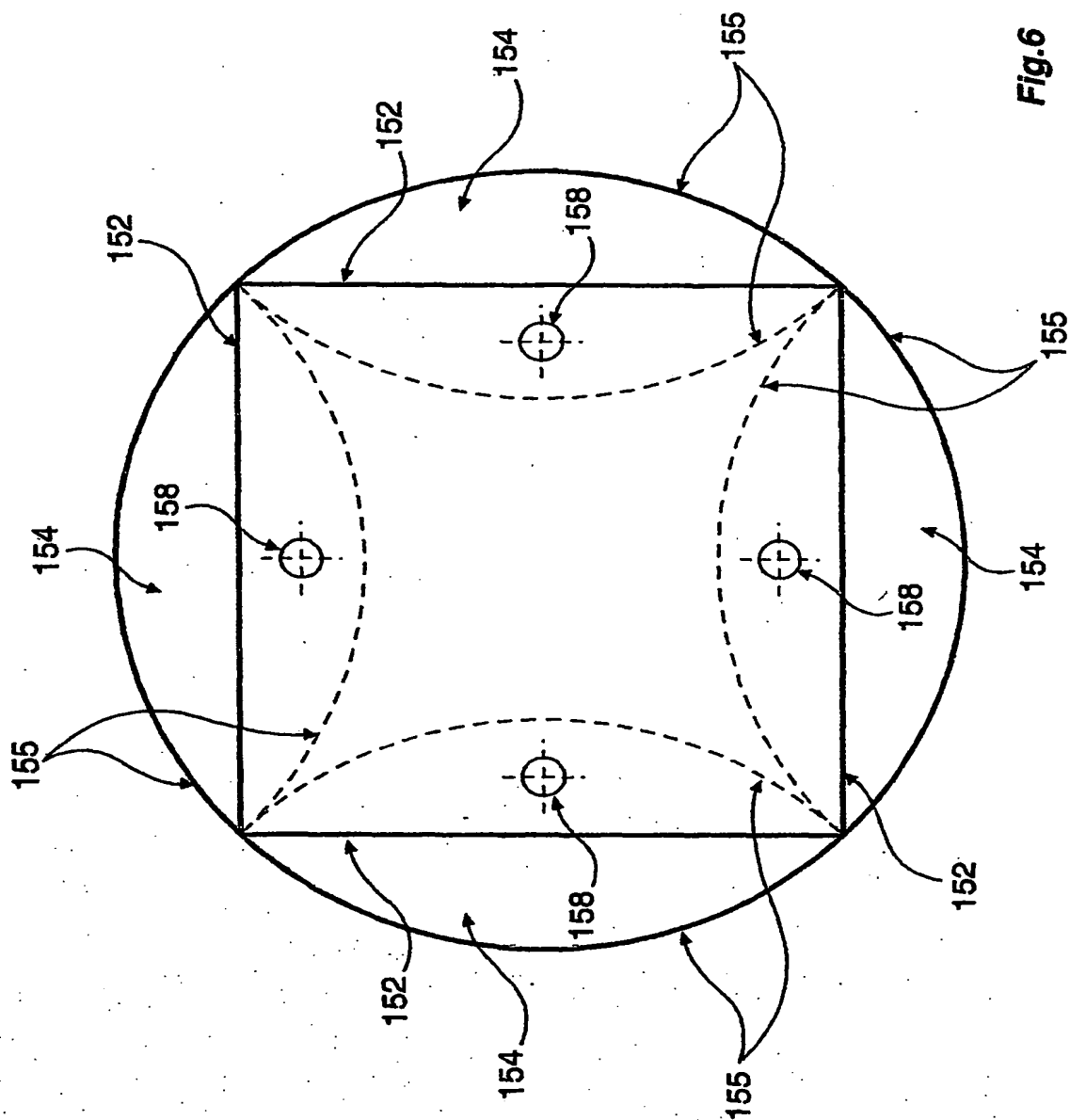


Fig. 5



INTERNATIONAL SEARCH REPORT

International Application No

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A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A47B1/03

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 032 588 A (WILLIAMSON PAUL DOUGLAS ET AL) 7 March 2000 (2000-03-07) column 2, line 19 - line 46 figures 1,2,7	1,9-11
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A	DE 381 614 C (PAUL ROHRMANN) 22 September 1923 (1923-09-22) the whole document	1-11
A	EP 0 903 092 A (KOLPING BILDUNGSWERK) 24 March 1999 (1999-03-24) figures	1-11

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European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

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Ottesen, R

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Information on patent family members

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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
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